

Louisiana Coastal Protection and Restoration (LACPR) Project Peer Review Plan

Introduction

In two Fiscal Year 2006 appropriation acts, Congress directed the Corps of Engineers “to conduct a comprehensive hurricane protection analysis and design” for southern Louisiana. This analysis was to include a “full range of flood control, coastal restoration, and hurricane protection measures” that would address protection for a Category 5 hurricane. The directive requested submittal of a preliminary technical report within 6 months (by 30 June 2006) and a final technical report within 24 months (by 30 December 2007). Based on this language, Congress initiated the Louisiana Coastal Protection and Restoration (LACPR) Study in January 2006.

Purpose and Need

This Peer Review Plan presents the process that assures quality products for the LACPR Technical Report to Congress. This QC and ITR Plan define the responsibilities and roles of each member on the study and technical review team.

In order to ensure a quality product for the LACPR technical report, USACE contracted two independent technical review teams (ITRs) to perform quality control, one external and one internal. Under the provision of the U.S. Army Corps of Engineers (USACE) policy regarding peer review as detailed in Engineering Circular (EC) 1105-2-408 dated May 31, 2005, specialists from organizations outside the New Orleans District, which is responsible for the study, will conduct the ITRs.

The product the teams will review the LACPR Draft Final Technical Report to Congress. This Peer Review Plan outlines the two ITRs and their function in the review process.

In addition to the traditional NED and NER assets and the calculations used to determine cost and benefits ratios, public and policy makers must have a clear understanding as to exactly what assets are to be considered for risk reduction measures as well as the matrices used to quantify them. The decision framework will expand on identifying these assets by describing the relative risk to which they are exposed. The actual data as to which planning unit assets are presumed to be in place once risk reduction measures are fully implemented will best inform policy. This data must include, and extend beyond, the traditional NED and NER factors to include the following:

- Economic assets of national significance.
- Economic assets of regional significance.
- Environmental assets.
- Population and other socially significant assets.

These assets align with the benefit accounts identified for traditional planning evaluation. Decision makers are likely to find it useful to know not only what particular assets are expected to be in place at the time any structural elements considered for construction might be completed, but also what assets have been in place in the past and in the present, that is, pre-Katrina and post-Katrina, as well as post-construction (which could be a decade or more in the future).

Goals and Objectives

The overall goals of LACPR are as follows:

- Conduct a comprehensive hurricane risk-reduction analysis and design to develop and present a full range of flood-damage reduction, coastal restoration, and hurricane risk-reduction measures for South Louisiana.
- Evaluate risk reduction for a range of storms from the 100-year to the 1,000-year storm event within the planning area.
- Conduct a transparent planning process to include independent technical review and external peer review.
- Engage the State of Louisiana, State and Federal agencies, stakeholders, and the general public as active partners in the planning process.
- Submit a final technical report within 24 months.

The following planning objectives were established to help develop the full range of flood damage reduction, coastal restoration, and hurricane risk reduction measures:

- Reduce risk to public health and safety from catastrophic storm inundation.
- Reduce damages from catastrophic storm inundation.
- Promote a sustainable coastal ecosystem.
- Restore and sustain diverse fish and wildlife habitats.
- Sustain the unique heritage of coastal Louisiana by protecting historic sites and supporting traditional cultures.

Opportunities

The LACPR effort has provided the opportunity for the USACE and the State of Louisiana to work closely together. This partnership offers the opportunity to integrate coastal restoration initiatives into a coastal defense system and build on existing State and Federal restoration programs in a systems approach rather than taking a piecemeal approach.

LACPR Project Delivery Team

Engineering Management

Cost Engineering

Coastal and Hydraulics Design

Hydrodynamic Modeling

Coastal and Hydraulics Risk/Statistics

Structures/Mechanical/Electrical Design

Geology and Geotechnical

Geotechnical and Structures Risk/Statistics

[REDACTED]

Geodesy and Topography

Economics

[REDACTED]

Real Estate

O&M Consistency

[REDACTED]

Information Management, Access, & GIS Contracting

[REDACTED]

Legal Advisor

Construction

[REDACTED]

Innovative Science and Engineering Technologies

[REDACTED]

Environmental Compliance, Design and Evaluation

[REDACTED]

Internal Review Process

Team and Budget

The USACE assembled the internal ITR through a comprehensive evaluation of technical experts in each technical discipline, placing emphasis on the Regional Technical Specialists (RTS) situated in each of the Planning Centers of Expertise. The final comprehensive team includes experts from 34 different disciplines (see Table 1 below). To assure an adequate independent review, no individual within the ITR team is associated with the project/product team.

Table 1 – Internal ITR Members

INDEPENDENT TECHNICAL REVIEW TEAM BY DISCIPLINE			
DISCIPLINE	TECHNICAL LEAD (#1)	TECHNICAL CO-LEAD (#2)	TECHNICAL CO-LEAD (#3)
Project Management	[REDACTED]	[REDACTED]	[REDACTED]
External Peer Review	[REDACTED]	[REDACTED]	[REDACTED]
PCX-HSDP	[REDACTED]	[REDACTED]	[REDACTED]
Engineering Management	[REDACTED]	[REDACTED]	[REDACTED]

Coastal and Hydraulic Design	[REDACTED]	[REDACTED]	[REDACTED]
Hydrodynamic Modeling	[REDACTED]	[REDACTED]	[REDACTED]
Coastal and Hydraulics Risk /Statistics	[REDACTED]	[REDACTED]	[REDACTED]
Structural Design	[REDACTED]	[REDACTED]	[REDACTED]
Electrical Design	[REDACTED]	[REDACTED]	[REDACTED]
Mechanical Design	[REDACTED]	[REDACTED]	[REDACTED]
Civil Engineering	[REDACTED]	[REDACTED]	[REDACTED]
Deep Draft Navigation	[REDACTED]	[REDACTED]	[REDACTED]
Interior Drainage, Pump Stations	[REDACTED]	[REDACTED]	[REDACTED]
Hydrology	[REDACTED]	[REDACTED]	[REDACTED]
Cost Engineering	[REDACTED]	[REDACTED]	[REDACTED]
Geodesy and Topography	[REDACTED]	[REDACTED]	[REDACTED]
Geology and Geotechnical	[REDACTED]	[REDACTED]	[REDACTED]
Geotechnical and Structures Risk/ Statistics	[REDACTED]	[REDACTED]	[REDACTED]
Innovative/ Science and Engineering Technologies	[REDACTED]	[REDACTED]	[REDACTED]
Spatial Analysis and GIS	[REDACTED]	[REDACTED]	[REDACTED]
Environmental Compliance	[REDACTED]	[REDACTED]	[REDACTED]
Cultural Resources	[REDACTED]	[REDACTED]	[REDACTED]
Biological Resources	[REDACTED]	[REDACTED]	[REDACTED]
Environmental Design and Evaluation	[REDACTED]	[REDACTED]	[REDACTED]
Economics	[REDACTED]	[REDACTED]	[REDACTED]
Plan Formulation	[REDACTED]	[REDACTED]	[REDACTED]
Real Estate	[REDACTED]	[REDACTED]	[REDACTED]
O&M Consistency	[REDACTED]	[REDACTED]	[REDACTED]
Information Management, Access, and GIS	[REDACTED]	[REDACTED]	[REDACTED]
Contracting	[REDACTED]	[REDACTED]	[REDACTED]
Constructability/ Value Engineering	[REDACTED]	[REDACTED]	[REDACTED]

Regional Sediment Management	[REDACTED]	[REDACTED]	[REDACTED]
P2/Accounting	[REDACTED]	[REDACTED]	[REDACTED]
<i>Italics indicate participated in New Orleans/Mississippi Site visit 20-23 March 2006</i>			

Budget

The final selected team and associated ITR budget was based on specific LACPR project requirements and is listed below in Table 2. The EPR budget is presented in Appendix A.

Table 2 – ITR Budget

LACPR INDEPENDENT TECHNICAL REVIEW BUDGET		
Discipline	Name	LACPR PTR (6-month report) Budget (\$)
Project Management	[REDACTED]	35,000
	[REDACTED]	30,000
	[REDACTED]	8,000
Engineering Management	[REDACTED]	8,000
	[REDACTED]	7,000
Coastal & Hydraulic Design	[REDACTED]	12,000
	[REDACTED]	
	[REDACTED]	
Hydrodynamic Modeling	[REDACTED]	7,000
Coastal and Hydraulics Risk/Statistics	[REDACTED]	7,500
Structural Design	[REDACTED]	4,000
Electrical Design	[REDACTED]	1,500
Mechanical Design	[REDACTED]	1,500
Civil Engineering	[REDACTED]	12,000
	[REDACTED]	0
Deep Draft Navigation	[REDACTED]	4,000
Interior Drainage, Pump Stations	[REDACTED]	7,500
Hydrology	[REDACTED]	5,000
	[REDACTED]	2,500
Cost Engineering	[REDACTED]	3,000
Geodesy and Topography	[REDACTED]	2,500
Geology and Geotechnical	[REDACTED]	7,500
Geotechnical and Structures	[REDACTED]	7,500

Risk/Statistics		
Innovative/ Science and Engineering Technologies		7,000
		0
Spatial Analysis and GIS		2,500
		1,500
Environmental Compliance		9,000
		2,500
		1,500
Cultural Resources		3,500
Biological Resources		8,500
		3,000
HTRW		2,500
Environmental Design and Evaluation		13,500
Economics		7,500
Plan Formulation		12,500
Real Estate		3,000
O&M Consistency		3,000
Information Management, Access, and GIS		1,500
Contracting		0
Constructability/ Value Engineering		3,000
P-2		1,500
SUB-TOTAL		260,000
Contingency (20%) Sub-Total		50,000
Site visit travel funds		20,000
Total Budget FTR		330,000
Total Expended PTR		471,000
TOTAL ITR		801,000

ITR Certification / Issue Remediation

Certification of technical and legal review will accompany reports submitted for HQUSACE policy compliance review. The ITR team will summarize major issues raised, explain how issues were resolved, and identify technical review team members. This record will be submitted to the PCX for their certification. The Division/Office Chiefs will submit certification of technical and legal review at the conclusion of the independent review. The PCX Chief's

signature also certifies that the sub-product reviews were accomplished satisfactorily in accordance with the procedures established within each PCX.

Study team members, Technical Managers, Project Managers, and Functional Chiefs retain responsibility for the quality and timely execution of study tasks in accordance with milestones, costs and commitments as identified in the March 9, 2006 version of the Project Management Plan. The Review Team provides ancillary quality control, not replacement of existing responsibility for technically accurate, high-quality products. The QCP provides a thorough review of Draft and Final products, when available, and identifies and resolves problems in conjunction with the Study Team before recommending PRB approval. Written review comments from the QCP are addressed to the Project Delivery Team for resolution. Unusual issues/conflicts that the Project Delivery and Review Teams cannot resolve may be addressed to an appropriate resource in the PCX-HSDP for guidance.

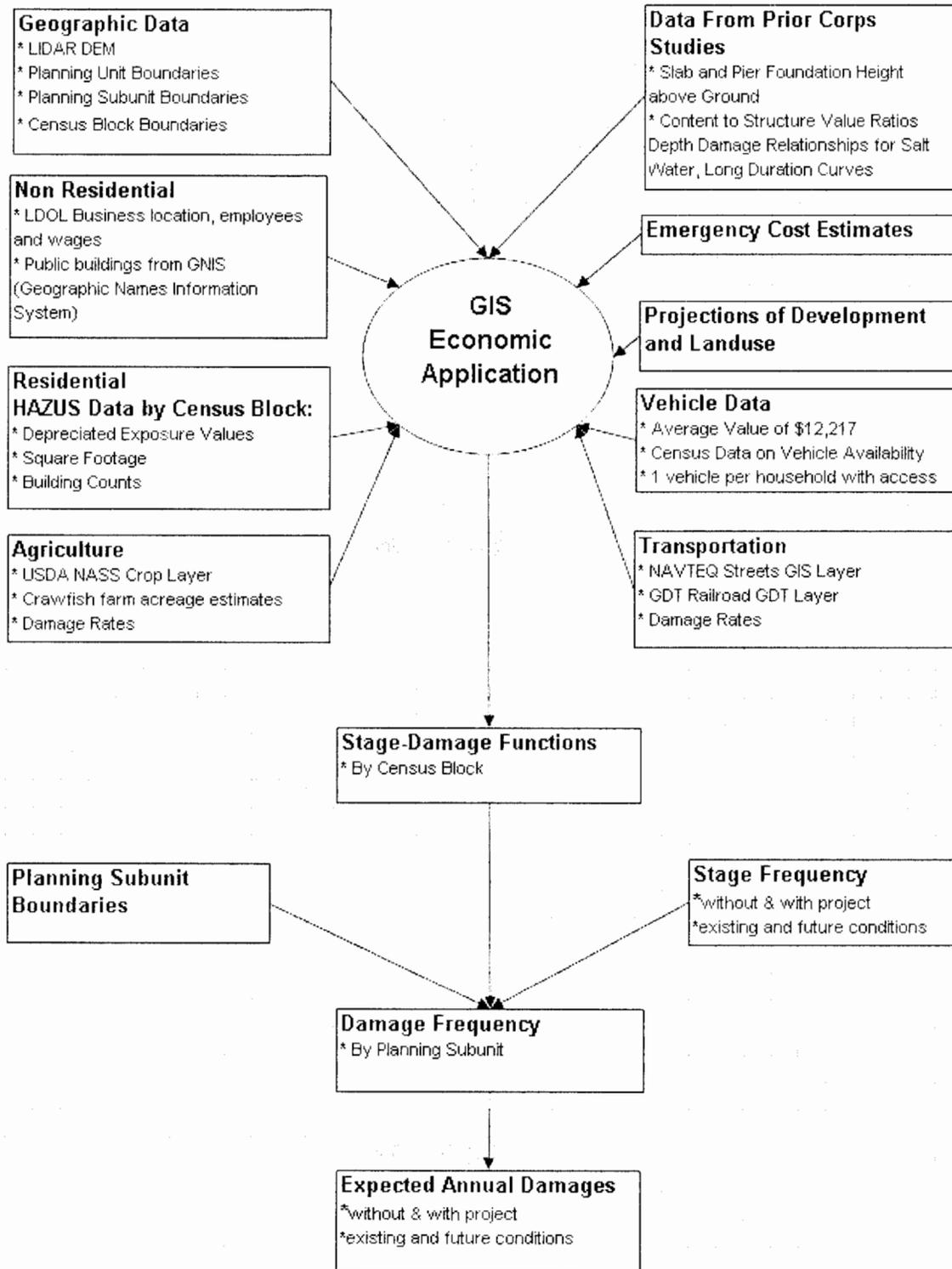
In the event that an issue requires resolution, PCX Chiefs of the performing ITR and host District should decide upon a compromise. If necessary, USACE HQ will make the ultimate decision.

Model Certification

Model certification will be performed by the appropriate ITR team members assigned to the respective technical areas of review. The LACPR planning team has developed and applied a range of GIS and spreadsheet base tools to assess performance of the various plan alternatives. These tools are also fed by basic hydrodynamic design data emanating from the hydrodynamic modeling and analysis performed to develop the alternative features. The principle plan evaluation tools focus on the evaluation of economic, environmental, and cultural effects of storms with and without alternative actions.

These include Environmental spreadsheets for performance analysis and spatial integrity and stability, as well as a diversion land building forecasting model. A cultural resource impact GIS tool has also been developed and applied. The largest set of evaluation tools is associated with the evaluation of economic performance. This system links the hydrodynamic model outputs with numerous economic datasets through a GIS platform. A network diagram of this system is shown in the figure below

Figure 1
Louisiana Coastal Protection and Restoration
GIS Economic Application Flowchart



Submitted Documents

This document will focus on specifics associated with the ITR review of the Preliminary Technical Report since specific FTR documents have not yet been identified. Specific PTR to be reviewed include:

- Main Report
- Project Management Plan
- Appendices
 - History of Hurricane Occurrences
 - Damage Assessments/ Economics Report
 - Environmental Conditions
 - Wind, Waves, and Water Workshop Report
 - Plan Formulation Workshop Report
 - Engineering Innovations Workshop Report
 - Public Scoping Meetings Report
 - List of Public Outreach Activities
 - Fish and Wildlife Service Planning Aid Report
 - State of Louisiana Plan Formulation Report
 - Engineering Appendix

Charge to the ITR Team

As stated in EC 1105-2-408, the PCX will prepare a charge to the reviewers that will include instructions regarding the independent peer review and the specific advice sought. The charge should include specific technical questions while also directing the reviewers to offer a broad evaluation of the overall document.

An ITR of the LACPR Preliminary Technical Report will be performed to critique Category 5 hurricane and storm damage risk-reduction for the Southern Louisiana Coast, prevention of saltwater intrusion, preservation of fish and wildlife, prevention of erosion, and other related water resource purposes. While National Economic Development (NED) analyses were not required or performed, the cost-effectiveness of the plan and each project should be considered. The PTR should offer short-term solutions based on existing data and information, and discuss how these solutions will establish a basis for further investigations of comprehensive, long-term solutions. The team must consider that there will be performance limitations to the analysis and the level of detail included in the PTR due to the accelerated schedule. This effort should coordinate with storm protection initiatives developed as part of the LACPR and IPET initiatives.

The ITR should develop a path-forward to develop final recommendations to be included in the Final (24-month) report. The final report will define in-part final evaluation criteria, performance measures and final management measures, identify a Final Array of Alternatives (FAAs), and develop a conceptual design and cost estimates for FAAs (from 9 March 2006 PMP, p.20). With this in mind, consider the following when reviewing the Interim Report.

The role of the ITR team is to ensure that the Project Delivery Team (PDT) is proceeding in a logical manner in accordance with the Corps of Engineers' planning principles as set forth in the Principles and Guidelines and the Planning Guidance Notebook, but does not replicate, or review each individual technical analyses. In addition, the application of the two aforementioned documents in the formulation of the project has been and will continue to be somewhat limited

by the language of the study authorization and the terms of the guidance issued pursuant to that authorization.

ITR Review Schedule

The ITR Team was allocated 10 days to review the aforementioned submitted documents. The schedule is presented below:

- Day 1 Receive PTR and appendices
- Day 3 ITR conference call to discuss individual disciplines with overall strategy. All members should review the report by this date.
- Day 6 COB All comments entered into Dr. Checks
- Day 8 COB Management Team review/QC comments for consistency, develop cover letter and executive summary.
- Day 10 COB Forward QC report to the New Orleans District

Comment Format / Dr. Checks

Listed below are some of the guidelines USACE developed for the ITR Team to employ as they review the technical documents, and make comments in Dr. Checks.

- All comments entered using Dr. Checks
- Focus on technical aspects, not grammatical
- As stated in Circular EC 1105-2-408, Peer Review of Decision Documents, ITR and EPR should focus on scientific information and highly influential scientific assessment, and should not apply to policy determinations and reviews, and agency exercise of discretionary authority that are beyond the scope of scientific and engineering peer review.
- Do not focus on policy departures as stated in the HQ guidance.
- Comments should consider analyses/elements not mentioned in the Interim Report that will be a necessary component in the Final Technical Report to meet study goals effectively.
- Comments should be made with respect to specific subject area within Dr. Checks.
- Keep comments objective; avoid subjective/personal

External Review Plan

A multi-discipline team, including members from the Corps' New Orleans District, Mississippi Valley Division, the Engineer Research and Development Center (ERDC), Headquarters (HQUSACE), and Planning Centers of Expertise are preparing the two LACPR reports. The team extends to multiple Louisiana agencies, multiple academic groups, and several Federal agencies including the National Oceanographic and Atmospheric Administration (NOAA), The Environmental Protection Agency (EPA), the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS), the U.S. Geologic Survey (USGS), and the National Resources Conservation Service (NRCS). Outside engineering and environmental firms are also involved in the project.

As part of the development of the LACPR project, external peer review of the two main products, the preliminary and final technical reports, will be conducted. This plan lays out how that external peer review will be accomplished for this project.

Guidance

Two main documents lay out the external peer review process. In a December 16, 2004 memorandum and its accompanying bulletin, the Office of Management Budget originally laid out the external peer review process. Within the Corps of Engineers, the primary guidance is documented in EC 1105-2-408 dated 31 May 2005. This engineering circular established the Corps’ procedures to ensure the quality and credibility of Corps decision documents.

The LACPR project will cover subject matter that is potentially controversial and precedent setting, having significant national interagency interest as well as significant national economic, environmental and social effects. Consequently, the vertical management team concluded that external peer view is required in accordance with the established guidance. Based on that guidance, the vertical management team requires the National Planning Center of Expertise for Coastal Storm Damage Reduction (PCX-CSDR), located in the North Atlantic Division (NAD), conduct the LACPR external peer review. Thus, the NAD’s PCX-CSDR is responsible for the accomplishment and quality of the external peer review process.

Project Team

To conduct the external peer review (EPR), the PCX-CSDR has delegated the lead for this work to the Baltimore District. Key members of the Baltimore District team and their roles are listed below.

Table 3 – EPR Team Members

Name/Office	Phone Number	Roles and Responsibilities
[REDACTED]	[REDACTED]	EPR project manager Main POC with Corps offices (NAP/NAD/MVN) Main POC with contractor CEFMS and P2 processing Development of peer review plan Scope and document reviews
[REDACTED]	[REDACTED]	Contract coordination Development of work order scopes Document reviews Preparation of independent government estimates
[REDACTED]	[REDACTED]	Scope and document reviews Preparation of charges and peer review reports Technical guidance on peer review process Input for peer review plan

6-Month Preliminary Technical Report

General Process

Since the initial peer review process was on an accelerated schedule, the Baltimore District contracted the procurement of the peer reviewers to Battelle, an external organization with specific experience in managing expert review panels. The Army Research Office (ARO) in North Carolina, which has indefinite delivery contracts for this type of support, conducted the procurement using two work orders.

The first work order was for Battelle to prepare a detailed work plan and to identify a minimum of 15 available experts for potential inclusion on the peer review panel. The Baltimore District team and the PCX-CSDR reviewed the detailed work plan for accuracy and completeness. [REDACTED] of Philadelphia District coordinated the review among the pertinent PCX-CSDR representations (NAP, NAN, and NAD).

The second work order was to contract with the selected experts to perform the peer review and to prepare the peer review report. Similar to the first work order, the Baltimore District team and the PCX-CSDR reviewed the peer review report for accuracy and completeness, but [REDACTED] coordinating the action.

Peer Review Panel

The external peer review of the preliminary technical report addressed the following:

- Overall adequacy of the scope and structure of the report, and soundness of assumptions;
- Additional data or analyses required to make a good decision regarding implementation of alternatives; and
- Identification of adequate multi-objective water resources alternative plans that will be carried into the final technical report.

The external peer review panel was directed to recognize that the information provided had only been developed to a reconnaissance level, not a feasibility level of effort. Given this, the external peer review specifically addressed the following:

- Description of recent and past hurricane damage;
- Description of existing hurricane protection features;
- Description of hurricane threats to South Louisiana;
- Communities at risk;
- Industries at risk;
- Strategic resources at risk;
- Impact on the nation;
- Sufficiency of collaboration between the Corps of Engineers and other parties;
- Evaluation of design storm(s);
- Physical conditions such as topography,
- Local planning units;
- Risk methodologies and risk models;
- Conceptual engineering and design;
- Impacts to significant resources; and
- Results and conclusions.

If these issues were identified as being inadequately addressed, the external peer review was directed to identify what additional analyses or data were required to address each issue adequately. The external peer review panel was told that they were to address scientific and engineering issues, not policy matters.

As part of the initial work order, Battelle identified 65 expert candidates for consideration on the peer review panel, who met the following minimum criteria:

- Be available for the entire review period including potentially responding to Corps responses to peer review panel comments;
- Be a subject matter expert in their field;
- Be unbiased;
- Be not employed by the Corps of Engineers; and
- Have no conflict of interest with the LACPR project – In particular, the nominee or their affiliated company could not have an ongoing or anticipated financial interest in projects under study as part of the Louisiana coastal work.

From these 65 candidates, nine reviewers were selected. The Baltimore District and Battelle team members were responsible for the selection of the final nine panelists; the selection of the panelists was coordinated with the PCX-CSDR following the selection, and communicated to the project team. However, those directly involved in the LACPR project were not consulted on the selection.

Selection Criteria

As part of this effort, Battelle identified peer review panelists who had the requisite qualifications and who could provide good, clear, and objective comments. Reviewers selected were primarily from academia, but also included one Federal government employee (NOAA) and two independent engineering consultants. Under Baltimore District's supervision, the Battelle staff developed the charge to the panel and surveyed the panelists to ascertain their availability. Once the panelists were identified, the Baltimore District and Battelle staff screened the panelists for eventual selection to the peer review panel. To make this selection, the screening panel used the following criteria:

Scientific and technical stature

Evidence of stature in the broad scientific and technical community (invited contributions to workshops, conferences or panels; evidence of scientific and technical leadership; awards, membership, or important committee assignments in prestigious organizations).

Advisory experience

Experience advising top managers and promoting constructive uses of science and technology, especially in arenas relevant to water and sediment management and/or ecosystem restoration.

Technical publications

A strong record of publication in peer-reviewed scientific literature or other appropriate venues in an area of expertise relevant to the issues at hand.

Relevant knowledge

Evidence of extensive and/or intensive working knowledge of a scientific or technical field related to the specific issues of concern.

People skills

Evidence of abilities to work and communicate well with people.

Reputation for achieving balance

Evidence of ability to weigh issues in a balanced manner when in an advisory capacity.

Interdisciplinary skills

Evidence of ability to work and think across disciplines, and/or experience in working with and advising on complex issues that integrate multiple disciplines.

It was important that the external peer review panel be comprised of multiple technical disciplines covering a broad area of study. Based on the peer review team's knowledge of the preliminary technical report, it was expected that the following disciplines would be required for the external peer review panel:

- Wetland ecology
- Sociology
- Economics
- Hydrology and hydraulics
- Geology and geomorphology
- Engineering – including but not limited to structural, cost, mechanical, and geotechnical engineering expertise
- Meteorology and hurricane expertise
- Water quality
- Risk assessment
- Modeling

Once a draft preliminary technical report was provided, the Baltimore District and Battelle re-evaluated the specific expertise needs and screened the peer review panel members, accordingly. In concert with the technical content of the preliminary technical report, the areas of technical expertise of the selected peer reviewers included:

- two engineers with expertise in civil or geotechnical engineering;
- two engineers/scientists with expertise in geology and/or hydrology;
- one engineer/scientist with expertise in hydrodynamics;
- two engineers/scientists with expertise in environmental engineering, wetland ecology, and coastal ecosystem restoration;
- one social scientist with expertise in evaluating human factors/impacts; and one economists.

Key Assumptions

All reviews, documents, and information sharing were handled electronically via electronic mail, ftp website, or CD storage. No travel would be required of the external peer reviewers.

Minor travel by Baltimore District employees to the Battelle site might be necessary but these costs would be minimal, with a funding limit of \$200.

Products

The main product for this effort was a peer review report for the 6-month LACPR preliminary technical report. This report contained a summary of the comments submitted, plus all direct submittals from the peer review panel. Several hundred review comments were received. The peer review report contained a list of the peer review panel members; however, the source of specific comments was not identified to avoid potential public attribution. This procedure was in keeping with the OMB guidance specified above. The Corps project delivery team was afforded the opportunity to respond to each review comment. The peer review report was completed in

June 2006 and submitted to the PCX-CSDR for transmittal to the project delivery team and eventual posting on the peer review website.

Schedule

The review of the preliminary technical report was accomplished in keeping with this schedule:

NAB designated for external peer review lead	16 March 2006
First Battelle work order awarded through ARO	31 March 2006
Draft detailed work plan submitted by Battelle	10 April 2006
Draft preliminary technical report provided to NAB	11 April 2006
Detailed work plan finalized by Battelle	17 April 2006
List of experts identified	1 April 2006
Battelle and NAB screen and select review panelists	27 April 2006
Second Battelle work order awarded through ARO	27 April 2006
Peer review panelists notified of their selection	28 April 2006
Preliminary technical report available for review	16 May 2006
External peer reviewers in place contractually	17 May 2006
Peer reviewers received the final draft report plus review charge	17 May 2006
Peer reviewers submitted all comments	25 May 2006
Draft peer review report completed by Battelle	26 May 2006
Project delivery team responds to reviewer comments	21 June 2006
Final peer review report completed by Battelle	22 June 2006
Final peer review report back checked and submitted to the PCX-CSDR	27 June 2006

Budget

Costs for the external peer review of the preliminary technical report occurred as follows:

Table 4 – EPR Preliminary Report Budget

Louisiana Coastal Protection and Restoration Project		Revised:	30-Oct-2007
External Peer Review Costs			
Preliminary Technical Report			
FY2006: March – July 2006			
Work Item	Resource Code	Resource Organization	Resource Cost
Project Management Costs	LABOR	E1H0400	\$12,146.41
Technical Review Costs	LABOR	E1K0500	\$24,279.37
ARO MIPR with EPR contractor, Work Order #1	WKBOTHFED	E1K0000	\$27,037.00
<u>ARO MIPR with EPR Contractor, Work Order #2</u>	WKBOTHFED	E1K0000	<u>\$75,738.59</u>
Total			\$139,201.37

24-Month Final Technical Report

Following completion of the preliminary technical report, the Corps Project Delivery Team (PDT) began work on the analyses required for the final technical report. Due to the complexity of analyses, the need for external peer review is even greater during this phase. To date, the PDT has reviewed three interim products. A short description of those specific review processes will follow.

The PCX-CSDR felt that it was very important that the overall technical report receive a thorough review by the National Academy of Sciences (NAS). NAS provides an independent, objective perspective from an esteemed body of scientists and engineers. In addition, the NAS review process has multiple safeguards in place that sustain an impenetrable firewall. To accomplish this review, in late 2006 and early 2007 the Baltimore District peer review team coordinated with the National Research Council, the NAS operating arm, for scoping the effort and laying out the review process.

From these discussions, the peer review team has determined that the normal NAS process is very structured and not accommodating to a quick turnaround of comments; normal turnaround is a minimum of 3 to 4 months, with no outside controls over the length of review. The normal NAS process produces a formal written document, which is subject to an extensive approval process. The panelists transmit informal comments by a verbal exchange; this, however, does not guarantee those comments will be included in the final written documents. The peer review team directly broached the interim informal reviews of special technical products with NRC staff, an option viewed very unfavorably by the NRC staff for several reasons:

- NAS prefers to focus on a single overarching report.
- NAS has an interdisciplinary focus on problems, not a technical focus.
- Interim products will lead to fragmentation of the NAS panel – the creation of sub-teams – and make the overall review more difficult.
- Multiple exchanges of technical documents will most likely lead to confusion among NAS panel members and subsequently the panel losing its focus.

The extremely tight LACPR schedule and the desires of the MVN project delivery team for speedy, near-immediate feedback on technical elements required a second type of review beyond the NAS review committee. Consequently, to accomplish the external peer review of the final technical report, the peer review team proposed the following process:

A National Academy of Sciences review panel will review the overall technical report, appendices, and environmental impact statement at both the draft and final stages.

A small concentrated group of experts specific to the product will review interim individual technical products on an as-needed basis.

Specifics for the two types of reviews are described below.

National Academy of Sciences (NAS) Review

Through its membership, NAS has access to the nation's leaders in science and engineering, providing independent, objective, and non-partisan reviews of the major technical and scientific problems facing our society. A very structured process that ensures high standards of scientific and technical quality governs the NAS review. According to NAS documentation, their study process is broken down into four major stages: (1) defining the study scope; (2) selecting and approving the review committee; (3) committee meetings, information gathering, deliberations, and drafting of the panel report; and (4) report review.

For Stage 1 of the LACPR review, the Baltimore District peer review team contracted with the National Research Council (NRC) which is the NAS' technical support organization, accomplishing the initial scoping of this effort in late 2006. In December 2006, the NRC governing board concurred in moving forward with the project and an initial scope. Finalization

of the NAS study scope occurred in April 2007, once HQUSACE approved the updated peer review strategy. Per NAS rules, the Executive Committee of the National Research Council Governing Board approved their statement of task, work plan, and budget.

The acquisition of the NAS-NRC services was accomplished via a sole-source contract between the Baltimore District and NRC. The costs for NAS-NRC services primarily include NRC staff and management labor costs. Additional costs covered include printing, photocopying, panel and staff travel, and meeting expenses.

Following completion of the scope definition, Stage 2 of the NAS review process began. NRC staff identified the specific expertise and experience needed to review the final technical report. The Corps' peer review team suggested the types of members; both the MVN project team and the PCX-CSDR solicited input for this effort. However, the final selection of individuals as well as expertise-types was solely the purview of NRC. The review panel generally consists of the disciplines identified earlier in this peer review plan for the preliminary technical report (see page 4). Each member of the review panel provides his or her services as a volunteer to the panel, receiving no compensation from the NAS, NRC, or the Corps of Engineers. NRC reimburses their travel and accommodations for meetings from the review study funds.

Once a peer review committee was identified in spring 2007, the President of the National Academy of Sciences approved a provisional slate of members. At the first meeting of the peer review panel in July 2007, the panel reviewed its technical and experiential make-up. Throughout this process, the NRC staff monitors the panel members for potential conflicts of interest.

Once the multi-disciplinary peer review panel was established, NRC staff conducted an initial meeting 25-27 July 2007 in New Orleans. In addition to panel discussions, the committee meeting included an on-site field visit, as well as discussions with the MVN project team. The initial meeting was intended as a fact-finding session. The LACPR team members were afforded the opportunity to explain the analyses conducted to date, those analyses planned for the study, and any study results. This part of the committee proceedings, as in all NAS review panel meetings, was open to the public. The NAS announced the meeting through their website. In addition to the public session, the NAS review committee also had closed door sessions to which Corps team members were not privy.

Following the initial meeting, the committee began an intensive information-gathering process. These efforts include the submission of information by outside parties, reviews of scientific and engineering literature, and the investigations of the committee members and NRC staff. Any materials provided to the review committee are available for public examination through the NAS public access files. This public access may be a key element in the consideration of the timing of the release of technical information. All levels within the Corps of Engineers should be aware of this situation. A second review session was conducted 15-16 August 2007. At that time, MVN team members updated the panel on recent study results, and introduced the panel members to the plan for multi-criteria decision analysis.

Once the draft technical report and appendices are provided to the NAS committee for review, the panel will convene again to draft its findings and recommendations. These deliberation meetings will be closed to the public in order to develop the findings and recommendations free from outside influences. The NAS will provide access to the brief summaries of these meetings

through their website, which will include the list of committee members present. However, all analyses and drafts of the review report will remain confidential permanently.

Once a review panel has completed its deliberations, the panel will write a report of its finding. In particular, this report will express the consensus view of the committee. This report will likely not include detailed technical findings, but be a general assessment of the formulation and analyses conducted. Based on the discussions with NRC staff, the final product for this initial review will likely be a 15- to 25-page document (“letter report” by NAS standards) similar to work performed for the IPET effort. Neither the public nor the Corps of Engineers will have access to the draft versions and specific technical comments.

Following the completion of the NAS draft review report, the committee’s report will undergo a separate rigorous, independent external review, as a final check on the quality and objectivity of the study. To undertake this review, NAS will recruit another set of independent experts to review the draft report prepared by the NAS review committee. Following this review and after all committee members and NAS officials have signed off on the report, it will be transmitted to the Corps of Engineers for informational purposes. Approximately 2 to 3 days after the transmittal, it will be released publicly via press release and the availability of a digital copy on the NAS website for downloading. The Corps of Engineers will not be given an opportunity to suggest changes in this report.

According to the current schedule laid out by the LACPR team (late October 2007), the NAS review panel is scheduled to examine the draft technical report and appendices starting 22 December 2007, with the final technical report review beginning in March 2008. With those dates of report release to the committee, NRC would have the goal of completing the peer review reports in mid-February 2008 and June 2008, respectively. However, based on discussions with Dr. Jeff Jacobs of NAS-NRC, the speed of this review may be optimistic given recent NAS experience. In particular, a 3½-month turnaround for a final panel report is ambitious for a consensus committee. However, NAS did indicate they would work with these schedule times as targets.

The NAS review essentially opens up the report to a public forum. According to discussions with NRC staff, they are accustomed to reviewing public technical reports. Given the public nature of the NAS process, the Baltimore District peer review team strongly recommends that the draft provided to the NAS panel have undergone HQUSACE review and approval for public release. The current schedule does allow for concurrent review by the independent technical review (ITR) team, as well as MVN policy and legal team members in November 2007. A submittal to HQUSACE follows in mid-December, thus allowing about one week of HQUSACE review prior to the draft report submittal to the NAS panel.

Schedule

The anticipated schedule for the NAS review is currently as follows:

NRC staff prepares initial scope – November 2006

NRC staff gets NRC board approval to go ahead with project – December 2006

NAS review scope is finalized with Corps (including schedule) – April 2007

NRC governing board approves the statement of task, work plan, and budget – April 2007

Corps processes funds to NRC for this effort – May 2007

NAS/NRC identifies panel members – May-June 2007

NRC convenes initial panel meeting to introduce project – 25-27 July 2007
NRC convenes second panel meeting for project update – 15-16 August 2007
NRC receives draft technical report/ environmental appendix – 1 March 2008
NRC convenes third panel meeting to discuss the draft technical report – TBD 2008
NAS completes review of draft technical report/environmental appendix – 15 February 2008
NRC receives final technical report/EIS – December 2008
NAS completes review of final technical report/EIS – April 2009

Based on discussions with the MVN team, it is understood that the draft technical report will be focused on technical investigations without making specific recommendations for project implementation. The NAS review committee will be focusing its efforts on the multitude of technical analyses. The draft report will include a decision-making framework appendix, but it will not be fully populated with stakeholder input.

For the final decision report will be much more specific about implementation recommendations. The report will document the decision-making process, particularly how stakeholder input was incorporated. The main report is expected to have substantial changes between the draft and final versions, while the technical appendices will probably not vary significantly. Because there will be only three weeks between the February 2008 NAS initial review report and the final report's release to the NAS review committee, the LACPR team anticipates no wholesale changes to the analyses. However, the March 2008 report will include a programmatic EIS as an appendix. Even though the NAS review committee will review the EIS appendix for accuracy of the technical analysis, a review for legal compliance with the National Environmental Policy Act (NEPA) is beyond the NAS purview.

Interim Technical Product Reviews

To facilitate rapid feedback on technical elements during the development of the technical report, the Baltimore District peer review team has contracted a small group of experts specific to the technical product in question. These experts focus on the technical analyses with an eye on the overall goal of the LACPR study. The interim peer reviewers have been experts in their field and of the same academic caliber as the NAS panel. The risk-informed decision framework and proof-of-concept effort proposed by RAND underwent this type of review in fall 2006, and in the March 2007 detailed study design of the multi-criteria decision framework for the Corps' Engineer Research and Development Center (ERDC).

The reviewers under contract were selected using a selection process similar to that performed for the preliminary technical report. The LACPR project team was not involved in any decision as to who were on the interim review teams. Depending on the LACPR project team needs, these panels convened as a group to discuss the product or submitted individual comments, which the external peer review team consolidated. The LACPR project team was afforded the opportunity to respond to these comments for the external peer review record.

This use of interim review teams maintained a strong firewall presence by their independence from the LACPR project team. However, their accessibility for information exchange and ability to render quick responses provided extremely valuable assistance to the project team. The interim reviews were a cost-effective way of reviewing the interim products while still enabling a strong separation from the final product review, thus safeguarding the integrity of the overall

process at a reasonable cost. By the strength of their academic credentials, the interim review teams will also add credibility to the Corps' technical work when the NAS committee reviews it.

To date, the Baltimore District external peer review team and the LACPR project team have work together to identify the appropriate interim technical products needing interim reviews and the timing of those reviews. For any future reviews, a minimum of 1-month advance notice will be required to confirm the contractual arrangements. Advance identification of the types of products to be reviewed will enable the external peer review team to assemble a cadre of peer reviewers for eventual use in the interim review panels.

To date, the following products were considered for interim review panels:

- Risk-informed decision framework – completed
- Proof-of-concept report – completed
- Detailed study design for decision-making – completed

Note that any LACPR-related efforts that have undergone NAS review under the IPET program will require no additional peer review through the LACPR study.

Risk-Informed Decision Framework Review

In mid-August 2006, the PCX-CDSR performed an external review of the risk-informed decision framework (RIDF). Focusing on decision analysis, the Baltimore District evaluated 11 potential reviewers in detail, selecting four to provide a written evaluation of the RIDF work. This review group came from the academic community, including the University of Washington, Carnegie Mellon University, Duke University and Johns Hopkins University. The RIDF document, along with a review charge and comment file, was distributed to the peer reviewers on 5 September 2006. Technical review comments were returned to the peer review team by 15 September 2006. The Baltimore District team collated the comments, submitting them to the LACPR team the same day. MVN responded to the review comments in early October 2006. The final peer review report for this effort was submitted to the PCX-CDSR on 5 October 2006.

Proof-of-Concept Review

As a follow-on to the RIDF analysis, the LACPR project team requested external peer review of the proof-of-concept report. Since the LACPR team intended the proof-of-concept report to be a practical application of the RIDF analysis, the original plan was to have the RIDF team take the proof-of-concept review as well. However, due to the timing of the document availability, two of the reviewers were not available to perform this service. Subsequently, the LACPR team considered additional candidates as replacements. Like their predecessors, the two supplemental reviewers also came from the academic community, the University of California-Davis and the University of Southern California.

The proof-of-concept review was conducted in two parts: (1) a fatal flaw analysis and (2) in-depth technical comments. The RAND proof-of-concept report and review charge were provided to the reviewers on 1 November 2006. Within a week, the reviewers provided their fatal flaw analysis, which was forwarded to the LACPR project team for consideration prior to a HQUSACE in-progress meeting. The in-depth technical comments were completed by 17 November 2006. The Baltimore District peer review team collated all comments and submitted to the LACPR project team shortly thereafter. MVN provided responses to the review comments

on 27 November 2006. The Baltimore team completed the final peer review report for this effort in April 2007.

Detailed Study Design Review

In early February 2007, the PDT informed the PCX-CDSR that the RAND risk-informed decision framework would not be used for the LACPR decision-making process. In lieu of the RAND work, the LACPR project team had brought in ERDC to perform multi-criteria decision analysis. The ERDC team members were in the process of developing a detailed study design for the multi-criteria effort, with planned completion in February 2007. On 8 February 2007, the LACPR project team requested the PCX-CDSR to conduct a peer review of the detailed study design. Unlike the earlier interim product efforts, the LACPR team indicated that a direct exchange with the reviewers would greatly enhance their efforts. They hoped that this type of exchange would lead to more specific and consensual guidance as to the direction of the decision-making process.

Subsequently, the Baltimore District peer review team contacted three of the reviewers from the RIDF work for potential involvement in the detailed study-design peer review. It should be noted that three reviewers had been planned originally for the RIDF review. When one of the selected reviewers could only guarantee a partial review, Baltimore added a fourth reviewer; since the partial reviewer has national prominence, his partial review was considered very desirable.

The three selected reviewers agreed to perform the review. Contracted directly by the Baltimore District, all three reviewers came from the academic community, having backgrounds in decision analysis. On 5 March 2007, the ERDC-prepared document was provided to the reviewers electronically. On 9 March 2007, an information exchange with the LACPR project team was held. The reviewers met with the LACPR project team in Baltimore; this location was selected for its geographic centrality to the reviewers (Carnegie Mellon University, Duke University, and Johns Hopkins University). A designated lead reviewer then prepared a consensus document; a draft version was circulated to the LACPR project team within a week, with the final version being forwarded to the project team on 19 March 2007.

Budget

Table 5 – EPR Draft Final Report Review Budget

Louisiana Coastal Protection and Restoration Project			Revised: 30-Oct-2007
External Peer Review Costs			
Final Technical Report			
August 2006 – September 2008			
Work Item	Resource Code	Resource Organization	Resource Cost
Contract with the National Academy of Sciences	AESVCS	E1K0000	\$565,000
Technical Review Costs	LABOR	E1K0500	\$50,000
Contract Procurement/Invoicing Costs	LABOR	E1P0100	\$23,294
Risk-Informed Decision Framework Review	AESVCS	E1K0000	\$5,978
Proof-of-Concept Review	AESVCS	E1K0000	\$8,481
Detailed Study Design Review	AESVCS	E1K0000	\$15,331
Project Management	LABOR	E1H0400	\$59,000
Miscellaneous Travel Costs	TRAVEL	E100000	\$4,000

<u>Contingency</u>			\$39,916
Total			\$771,000

References

National Academy of Sciences' website, www.national-academies.org

The National Academies, *Our Study Process: Ensuring Independent Objective Advice* brochure, undated.

The National Academies, *Guidelines for Review* brochure, undated.

Discussions with Dr. Jeffrey W. Jacobs, Water Science and Technology Board, National Research Council, October 2006 to February 2007.

Office of Management Budget, *Final Information Quality Bulletin for Peer Review*, as issued in a December 16, 2004 memorandum.

U.S. Army Corps of Engineers, CECW-CP, *Peer Review of Decision Documents*, EC 1105-2-408, 31 May 2005.

U.S. Army Corps of Engineers, CECW-CP, *Planning Models Improvement Program: Model Certification*, EC 1105-2-407, 31 May 2005.

U.S. Army Corps of Engineers, CECW-CP, *Planning in a Collaborative Environment*, EC 1105-2-409, 31 May 2005.

U.S. Army Corps of Engineers, CECW-CP, *Planning Guidance Notebook & Appendices*, EC 1105-2-100.

